

MINE PLAN OF OPERATION AND CLOSURE/CLOSEOUT PLAN

COPPER MOUNTAIN SOUTH PIT EXPANSION PROJECT

Phelps Dodge Tyrone, Inc.
GRANT COUNTY, NEW MEXICO

Filed with:

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1.0 INTRODUCTION AND OPERATOR INFORMATION

Phelps Dodge Tyrone, Inc. (PDTI) is proposing an expansion of the existing Copper Mountain Pit at the Tyrone Mine located approximately ten miles south of Silver City in Grant County, New Mexico. The proposed South Pit will be an extension of the existing Copper Mountain Pit and will be developed to continue the processing of copper-bearing ore by leaching the ore on existing stockpiles and subsequent solution extraction/electrowinning (SX/EW) of pregnant leach solution (PLS). The proposed Copper Mountain South Pit will be located on the southern edge of the existing Copper Mountain Pit on PDTI and U.S. Bureau of Land Management (BLM) land (Map 1). PDTI proposes to expand the permit boundary to include an additional 74 acres adjacent to the current southern boundary of the Copper Mountain Pit. The proposed development will occur on patented land controlled by PDTI (17.2 acres) and on approximately 13.9 acres of land managed by the BLM (Map 2). The actual mine disturbance will be within the 31.1 acres described; however, reclamation of drill sites, roads and possibly other environmental controls extend beyond the pit disturbance area of the South Pit.

The proposed Copper Mountain South Pit Expansion will increase the Tyrone Mine permit area by less than 1 percent. The planned expansion is in Sections 21 and 28, T.19 S., R.15 W. The copper mineralization within the proposed Copper Mountain South Pit is predominantly copper oxide mineralization (e.g. chrysocolla). No new facilities are needed for mining and processing the ore from the proposed Copper Mountain South Pit.

Mining in the proposed Copper Mountain South Pit Expansion is scheduled to take up to four years to complete. Mining will be conducted at an average rate of between 40,000 to 90,000 tons of material per day. The South pit will produce approximately 36 million tons of ore containing approximately 72 million pounds of recoverable copper. The proposed Copper Mountain South Pit Expansion will be mined using conventional open pit mining techniques and equipment.

The plan presented herein is a combined Mine Plan of Operations and Closure/Closeout Plan (MPO/CCP). The primary purpose of this document is to satisfy BLM (43 CFR-3809) and NM Mining Act (Section 19.10.5.508) regulatory requirements administered by the New Mexico Mining and Minerals Division (MMD). This MPO/CCP is also intended to complement the Tyrone Closure/Closeout Plan (CCP) submitted in March 2001.

1.1 OPERATOR INFORMATION

Project Name: Copper Mountain South Pit Expansion
Corporation Name: Phelps Dodge Tyrone Inc.
Federal ID: 13-1808503
Partnership Information: PDTI is a wholly owned subsidiary of Phelps Dodge Corporation

Property Ownership and Point of Contact Information:

Full Name: Rick N. Mohr
Title: General Manager
Business Name: Phelps Dodge Tyrone, Inc. (PDTI)
Telephone Number: (505) 538-5331
Street Address: P.O. Drawer 571, Tyrone, New Mexico 88065
Project Location:
Meridian: NMPM

Section: SE ¼ of Section 21 and the NE ¼ of Section 28
Township: 19 S.
Range: 15 W.
County/State: Grant County/ New Mexico
Claim Type: Lode
Claim Owner's Address: P.O. Drawer 571, Tyrone, NM 88065

BLM (Public Land Ownership) Contact Information

Name: US Department of Interior, Bureau of Land Management
Address: Las Cruces Field Office
1800 Marquess Street
Las Cruces, New Mexico 88005
Telephone: 505-525-4300

Claim Name(s): BLM BLM Serial Number

Fran No. 13 (3 acres)	NMMC# 69680
Fran No. 64 (2 acres)	NMMC# 69681
Fran No. 65 (5 acres)	NMMC# 69682
Bob No. 1 (5 acres)	NMMC# 169027
Bob No. 2 (7 acres)	NMMC# 169028

Total Acres of Surface Disturbance Anticipated:

Public Acreage:	13.9 acres
Private/PDTI Acreage:	<u>17.2 acres</u>
Total	31.1 acres

Statement of Compliance:

PDTI is in compliance with all Federal, State and local laws, regulations and ordinances that apply to this project (see Table 7, p. 4-1).

Statement of Basis (Right to Enter Property):

PDTI has the right to enter and conduct mining and reclamation activities on the Copper Mountain South Pit Expansion project area based either on PDTI's ownership of the patented mining claims (surface and minerals) in the project area or through the BLM approval of the enclosed MPO/CCP and subsequent Environmental Assessment for PDTI's proposed activities on federal lands administered by the BLM in this area. As this portion of the rules requires, PDTI will allow the Director to examine, if necessary, the documents which establish such basis.

2.0 MINE PLAN FOR COPPER MOUNTAIN EXPANSION

Expansion of the Copper Mountain Pit will occur on 17.2 acres of PDTI land and 13.9 acres of BLM land (Map 1). Mining is planned to begin when all applicable permits are received and will continue for a period of up to four years. The mining limits and property ownership are shown in a plan view in Map 2. Mining will be conducted at an average extraction rate of between 40,000 to 90,000 tons per day. Production from the pit during this time will total approximately 36 million tons of ore containing approximately 72 million pounds of recoverable copper. Appropriate blasting patterns and a bench height of 50 feet will enable cost-effective mining and processing of the ore.

A haul road will be extended from the 6,400 foot elevation of the Copper Mountain Pit and will spiral downward as the South pit is mined (Map 1). Based on the current mine plan, the Copper Mountain South Pit Expansion will be mined such that a small portion of the expanded pit area will reach an elevation of approximately 6,000 feet. This will not be the low point in the Copper Mountain Pit. Electric power will be extended into the South pit as required from existing power lines and electric power substations. The existing Copper Mountain dewatering system, consisting of collection system, pumps, electric power supply, and pipeline, will be used to handle any required pit dewatering.

As currently defined, approximately 27 million tons of barren rock will be placed in the San Salvador Pit (See Map 1 for reference). The material that will be mined from the Copper Mountain South Pit will be predominantly non-acid-generating, therefore special handling methods are not necessary and the material should not pose any environmental concerns. The San Salvador Pit is currently partially backfilled with waste rock from the Tyrone Mine operations.

Ore that is extracted from the mine will be placed on an existing, permitted leach stockpile and stacked in appropriate lift heights to ensure optimal copper extraction. A drip emitter or spray irrigation system will be placed over the ore, and acidic solution will be percolated through the ore for an appropriate period of time. Adequate leach stockpile capacity exists at Tyrone to handle the ore that will be mined from the Copper Mountain South Pit. The No. 2 leach stockpile system will be utilized for this ore. The collection systems associated with these stockpiles will be used without modification.

Existing utilities and services will be used to support the mining operation. The water supply for the Tyrone mine will not be affected by the development of the Copper Mountain South Pit Expansion. Additional water will not be required for mining of the proposed pit. Changes to the current water supply distribution system or the existing water treatment systems will not be required. The development of the Copper Mountain South Pit Expansion will not change the existing PDTI power requirements. The existing PDTI electric power distribution system will be used to provide power to the proposed pit.

2.1 MAPS

The following maps are provided in the MPO/CCP:

Table 1
LIST OF MAPS

Map	Features
Map 1 – Copper Mountain Pit Expansion	Project Vicinity, Existing Mine Features, Proposed Expansion, Waste Rock Disposal Area, Haul Road
Map 2 – Property Ownership	Property Ownership
Map 3 – Underground Openings & Sample Sites	Underground Openings & Sample Sites
Map 4 – Reclamation Area	Areas of Disturbance, Reclamation Areas
Map 5 – Deadman Canyon/Pit Expansion Cross-Section	Cross Section showing Deadman Canyon and the Pit Expansion This Map also shows Slope Stability/Design Information
Map 6 – Revegetation Reference Area	Revegetation Reference Area

2.2 OPERATING PLANS

2.2.1 General Operations

PDTI began mining oxide ore from the Copper Mountain Pit in July of 1990. Mining of the original Copper Mountain Pit was completed in February of 1994. A small extension on private land along the south side of the original Copper Mountain Pit was mined from April 2000 until January 2002. A total of 71 million tons of ore and 16 million tons of waste rock have been mined from the Copper Mountain Pit by PDTI. Total depth of the original Copper Mountain Pit was 400 feet at an elevation of 6000 feet amsl.

Proposed activities for the Copper Mountain South Pit Expansion include:

- Layback of the southwest edge of the existing Copper Mountain Pit
- Extension of an existing in-pit 46 kV power line to provide power to an electric shovel
- Removal of a historic leach stockpile left by previous operators
- Placement of extracted ore on existing leach stockpiles
- Placement of barren material on existing waste stockpiles or reclamation areas
- Leaching of the ore on existing stockpiles to extract copper in PLS
- Processing of PLS at the Tyrone SX/EW Plant and production of copper cathode
- Use of existing PDTI mining facilities, including the truck shop, change rooms, water supply, electrical substation, power distribution system, etc. to support the mining of the pit.

There will be no new permanent development on-site, except for fences with gates and signs around the perimeter of the expansion area. Existing facilities and developments will be used to support mining of the proposed Copper Mountain South Pit Expansion.

Temporary on-site development will include electric supply lines, water lines, and a water fill-up station. Lights will be used on equipment in the pit and at the water fill-up. No general pit lighting will be employed. Mining operations are exempt from the requirements of the New Mexico “Night Sky Protection Act.”

2.2.2 Surface Mine Operations

The proposed pit expansion will be mined using conventional open pit mining techniques and equipment. The pit expansion will be developed from the existing Copper Mountain Pit. A haul road will be extended from the 6400 feet (above mean sea level) elevation of the Copper Mountain Pit and will spiral downward as the expansion is mined. Based on the current mine plan, the expansion portion of the project will be mined such that a small portion of the expanded pit area will reach an elevation of approximately 6000 feet. This will not be the low point in the Copper Mountain Pit. Electric power will be extended into the expansion as required from existing power lines and electric power substations along areas previously mined by PDTI. There will be no additional disturbance of BLM land for the power or water lines. The existing Copper Mountain dewatering system, consisting of collection system, pumps, electric power supply, and pipeline, will be used to handle any pit dewatering that will be required. No chemicals, fuels, lubricants, or hazardous materials will be stored in the pit expansion area.

Before mining operations begin in the Copper Mountain South Pit Expansion Area, a BLM and MMD approved wire fence will be constructed around the perimeter of the pit area to preclude the public, big game, and cattle from wandering into an active mining area while heavy equipment is being utilized for mining and reclamation purposes.

Based upon input from the New Mexico, Department of Game and Fish, the proposed design will be a 4-strand wire fence with the top and bottom wires un-barbed. The wire heights from the ground as measured at the T-Posts, are 16”, 22”, 28” and 38”.

Weatherproof “Keep Out” signs will be posted at 200-foot intervals along the rock berm and fence to provide notice to the public. The rims of the open pits readily accessible by the public will be blocked by a substantial rock berm.

Material Stripping Techniques

The mine site is located in an area of rugged terrain with rock outcrops and minimal topsoil. In the USDA Soil Conservation Service, Soil Survey of Grant County, New Mexico, the soils within the pit expansion area are identified as a combination of Disturbed Lands, and of Santa Fe-Rock Outcrop Complex. Since topsoil is mostly nonexistent within the project area, no topsoil is proposed to be salvaged. Should salvageable topsoil be encountered during development, this material will be collected and stockpiled for use in final reclamation. The proposed location for storage of any topsoil if encountered is depicted on Map 4.

There will be no pre-production period. Approximately 36 million tons of ore will be extracted from the pit expansion along with approximately 27 million tons of barren rock.

Drilling Techniques

Blasthole drilling is accomplished using Bucyrus Erie 60R and 49R rotary drills or equivalent. The rotary drills are crawler mounted and capable of drilling 12 ¼ inch diameter holes. A drill pattern, with an average of 27-foot spacing will be used in most cases. Other spacing and special practices are utilized in areas requiring special consideration for pit slope stability or rock fragmentation. Blastholes are drilled to develop benches with 50-foot heights based on ore control considerations and to allow for the effective use of drills and shovels. Subgrade drilling of six to seven feet below the bench is considered to be adequate to permit digging and result in a smooth bench floor. Appropriate drill patterns will be designed to allow for adequate fragmentation of the rock.

Blasting Techniques

The blast hole size is dictated by explosive density and explosives used per ton of broken rock. An explosives contractor will load the blast holes with bulk blasting agent (ANFO) and delayed primer explosives that permit timing the sequence of initiation. The PDTI blasting crew will carry out all other blasting functions.

The supplier of the blasting agents will utilize their existing, safe storage facility on PDTI property. Transportation and storage of explosive materials will be conducted in a manner approved by all appropriate State and Federal regulatory agencies. There will not be an increase in explosive usage as a result of the development of the Copper Mountain South Pit Expansion.

Cuttings from the blastholes are sampled and assayed for determination of material type and copper grade. Material is designated as waste, leach ore, or low-grade leach. Blasting is done only during the day shift on a five-day per week basis. A Tyrone mine crew sleeves, primes and stems the blastholes, and an outside contractor dewaterers and pumps blasting agents into the holes. Blasting agents in use at Tyrone include emulsions, ANFO, and aluminized ANFO. Minor secondary blasting is required for boulders and hard bench toes.

Benching Techniques

Mining will proceed along benches that will be drilled and blasted to 50-foot heights. The width of the bench will be dictated by safety considerations and pit slope considerations. The width will allow for the safe operation of haulage trucks with safety berms. Flat surfaces such as bench tops and haul roads will be ripped and revegetated consistent with the Tyrone Mine Closure/Closeout Plan.

Load/Haul/Dump Techniques

Caterpillar trucks with the capacity to haul 190 - 250 tons will be loaded at the working face by an electric and/or hydraulic shovel. The trucks will haul each load of ore to the No. 2 Leach Stockpile system and each load of waste to the San Salvador Pit.

Production

Mining will be conducted at an average extraction rate of between 40,000 to 90,000 tons per day.

Periods of Operation and Operating Hours

The mine will normally work two 12-hour shifts per day, 365 days per year.

Mine Dust Control

In general, open pits associated with mines do not experience significant mixing of ambient air below the pit rim with the air flow above the rim. Consequently, control of fugitive dust generating activity below the rim will not be required. However, haul road fugitive emissions above the pit rim may contribute to off-site impacts. Continual watering will be applied to the haul road as the primary method for controlling dust. Additionally, haulage speeds will average approximately 15 mph over the life of the project. Truck speeds will not exceed 33 mph. The maximum speed would only be attained when trucks are empty and on a flat road; speeds will be lower than average on other segments of the route; i.e., downhill empty, uphill empty, downhill loaded, and uphill loaded.

The proposed action will not require a modification to the existing air quality permits or any additional air quality permit. Potential effects to air quality are from wind blown particulate matter from the No. 2 Leach Stockpile system and from mining operations. When the mine is in operation in this area, the wetting of access roads and haulage roads reduces dust generated from vehicular traffic. When leaching is in operation, the wetting of stockpiles with raffinate similarly reduces particulate emissions. PDTI's mining operations are currently in compliance with state and federal air quality regulations and the proposed action will also be in compliance based on PDTI's existing air quality permits.

Equipment Used On-site

The following table lists the equipment that will be used for mine production:

Table 2
EQUIPMENT REQUIREMENTS

Activity	Equipment
Loading	One Caterpillar 5230 hydraulic shovel or equivalent. One P&H 4100 electric mining shovel or equivalent.
Hauling	The existing PDTI haul truck fleet of Caterpillar trucks (190 and 250 ton capacity) will be used.
Drilling	The existing PDTI drill fleet will be used; the fleet consists primarily of Bucyrus Erie 49-R and 60-R drills or equivalent.
Road Maintenance	The existing PDTI road maintenance fleet, consisting of motor graders and bulldozers will be used. Existing water trucks will be used for dust suppression on the haul roads.
Mine Mechanical Service	Existing mine service trucks, maintenance equipment, and maintenance shops will be used.
Mine Service and Supervision	No changes will be made in the level of mine services and supporting equipment as a result of implementing the Copper Mountain Pit Expansion.

2.2.3 Processing Facilities

Ore that is extracted from the Copper Mountain South Pit Expansion will be placed on an existing, permitted leach stockpile and stacked in appropriate lift heights to ensure optimal copper extraction. A drip emitter or spray irrigation system will be placed over the ore, and acidic solution will be percolated through the ore for an appropriate period of time.

Adequate leach stockpile capacity exists at the Tyrone Mine to handle the ore that will be mined from the Pit Expansion. The No. 2 Leach Stockpile system will be utilized for leaching this ore. The collection systems associated with these stockpiles will be used without modification. Leachable ore will be placed on the leach stockpiles in 35-foot lifts. Drip emitters or spray nozzles will deliver raffinate (an acid solution) recycled from the SX/EW plant. The raffinate will percolate through the stockpile for an appropriate period of time to extract the contained copper to form the PLS. The PLS will collect in the permitted collection systems where it will be pumped to the SX/EW plant for processing and subsequent copper recovery.

The PDTI SX/EW plant has a conventional flow configuration, with six extraction stages and four stripping stages. The solution extraction phase of the operation extracts copper from the PLS and concentrates it in an electrolyte solution that is pumped to the electrowinning tankhouse. In the tankhouse, copper is electrolytically plated onto thin copper sheets to produce high quality copper cathode.

Periods of Operation and Operating Hours

The mine and SX/EW plant normally work two 12-hour shifts per day, 365 days per year.

Dust Control

Drip emitters or spray nozzles are used to spray liquid raffinate solutions on the surface of the leach stockpiles to facilitate the leaching process. This action keeps the surface of the stockpiles wet and prevents dust from being released from those areas under leach. The action of the leach solutions on the surface of the stockpiles causes a hard crust of gypsum minerals to form once the surface has dried. The crust also prevents dust from being released from these surfaces.

Equipment Used On-site

One bulldozer tractor will be used for stockpile maintenance.

2.2.4 Waste Rock and Tailings Disposal

Approximately 27 million tons of barren rock will be placed in the San Salvador Pit (Map 1). Based upon sampling results, the material that will be mined from the Pit Expansion is expected to be non-acid-generating, therefore special handling methods are not necessary and the material should not pose any environmental concerns. The San Salvador Pit is currently partially backfilled with waste rock from the Tyrone Mine operations. The leached cap waste material from the Copper Mountain Pit will not completely backfill the San Salvador Pit. Tailings disposal is not applicable to this project as leaching does not produce tailings.

2.3 WATER MANAGEMENT PLANS

Current and planned operations at the mine have been engineered to minimize water use, control contamination of groundwater, and prevent release of impacted surface water. The leachate collection system is already in-place and permitted. Pipelines that carry leach solutions from the leach pads to the PLS pond and to the SX/EW plant are in-place and are inspected for leaks on a regular basis. Surface water and groundwater quality will be protected throughout the period of proposed activity, and following closure.

Groundwater

The groundwater gradient in the project area is toward the Main Tyrone Pit. Excavation of the Copper Mountain South Pit Expansion is not anticipated to change the direction of the flow. The additional mining in the existing Copper Mountain Pit may result in more water being intercepted before it flows under the 4C Leach Stockpile.

New Mexico Environment Department (NMED) Groundwater Discharge Permit No. 166 (DP-166) for PDTI was initially approved on July 20, 1981 and subsequently renewed and modified on July 20, 1986, July 20, 1991, and December 16, 1997. DP-166 was amended on January 22, 1999 to include the North Racket sump as a PLS collection point. The latest DP-166 approval included 15 conditions and 13 specific requirements for operation, monitoring, contingencies, closure, and financial assurance (NMED 1997d) for several facilities that have the potential to affect ground water quality including the Copper Mountain Pit.

DP-166 has since expired and PDTI has applied to the NMED for its renewal. The renewal application includes the Copper Mountain South Pit Expansion.

PDTI conducts quarterly monitoring of groundwater levels and groundwater quality in order to detect changes in groundwater that could occur from the mining operations. Monitor wells are completed in specific intervals such as bedrock fracture zones which minimize the potential for commingling of groundwater. Post-closure monitoring will be performed in accordance with the Tyrone Mine Closure/Closeout Plan and the requirement of DP-1341. Map 3 shows the location of water monitoring sites for the project area.

Surface Water

None of the mining activities proposed under this POO will directly affect Deadman Canyon or any waters of the US. A small surface watershed, some of which is already diverted to Tyrone's water control system, will be diverted to the Copper Mountain Pit. Based on measurements of the drainage basin by PDTI engineers, it has been conservatively estimated that 40 acre-feet would no longer flow into Deadman Canyon over a 20- to 40-year time period. This is equivalent to less than one gallon per minute. The removal of this water from the watershed is expected to improve the quality of the surface water in Deadman Canyon.

The existing PDTI Storm Water Pollution Prevention Plan is consistent with the Clean Water Act's (CWA) National Pollution Discharge Elimination System requirements. The purpose of this plan is to minimize potential pollutant discharges to waters of the US (such as Deadman Canyon) and down-gradient impacts by implementing a plan for managing storm water runoff from PDTI's facilities. Surface water discharges are monitored and reported to EPA pursuant to the Multi-sector General Permit Program. The groundwater and surface water monitoring locations near the Copper Mountain Pit are shown in Map 3.

2.4 ROCK CHARACTERIZATION

The reserves in the Copper Mountain South Pit Expansion occur primarily as copper oxides. The ore and waste material that will be mined from the expansion will be predominantly non-acid-generating copper oxides and should not pose any environmental concerns. The ore and waste material that is mined will be placed on existing permitted stockpiles. Material will not be placed outside of the existing PDTI disturbance footprint.

According to the geologic model for the Copper Mountain South Pit Expansion, 36 percent of the material mined will be leach capping, 10 percent will be old stockpile, 54 percent will be oxide copper ore, and 0.01 percent will be mixed oxide-sulfide. The composition of leach capping is predominately iron oxides with no visible sulfides and very low-grade copper mineralization. It is a net-neutralizing material that is non-acid-generating. The oxide copper minerals are chrysocolla, malachite, and azurite, which are soluble in sulfuric acid, have no visible sulfides and contain leach-grade copper mineralization. It is a net-acid-neutralizing material that is acid consuming by nature.

The mixed oxide-sulfide material is composed of copper oxide minerals and chalcocite-pyrite minerals. It is a transition zone material that contains both oxide to sulfide minerals as well as leach-grade mineralization. This material composes 0.01 percent of the material to be mined and will be placed on an existing leach stockpile along with the rest of the oxide ores that are to be mined. None of the waste that will be mined is of this material type.

Acid-Base Accounting (ABA) analyses were performed on exploration hole pulp samples from holes that are located in the area where the final pit wall will be and on representative samples of the mined material. The Acid-buffering Potential (ABP) is the difference between the Acid-neutralization Potential (ANP) and the Acid-generating Potential (AGP) and is a means of assessing the potential for acid generation or neutralization of the mine materials. A standard method (EPA Method 600) was applied to assess these characteristics of the rock.

Four exploration drill holes were sampled at a total of fifteen depth intervals and sent for analytical characterization. The samples were chosen based on the proximity to the planned pitwall, and for representative mineral types that are expected to occur there with the exception of one sulfide sample. Although no sulfide is expected to be encountered in the final pitwall, one sulfide sample was also submitted for analysis. The analytical results are provided in Table 3.

All of the oxide mineral types tested show a strong net neutralizing potential (ANP) with a ratio of ANP to AGP of well over three for all samples except one which also did not have any measurable acid generating potential. ABP values range from zero (no AGP or ANP detected, one sample) to 46.7 T_{CaCO3} per 1000 T (46.7 tons calcium carbonate per 1000 tons of rock) and tend to increase with depth. The sulfide sample analysis yielded an ABP of 16.1 T_{CaCO3} per 1000 T (ANP to AGP ratio of 3.9). The sulfide mineralogy is also net neutralizing and has a low overall sulfur content.

The neutralizing capability of the rock can be explained by the original hypogene mineralization. Generally, hypogene mineralization within this area has a low sulfide content, has a high chalcopyrite to pyrite ratio and is associated with calcite. These are the main reasons that an oxide ore body has formed here instead of a sulfide orebody, and why the material has neutralizing potential. Overall, the material has an excess of neutralizing potential, as witnessed by the remaining buffering potential within the oxide mineral types.

Map 3 shows the location of exploration holes in the area of the proposed expansion. The mineralogy of the nearest hole (CE-4) indicates that the leached capping material is located spatially below green copper oxide material. This relationship results from deep leaching in highly fractured fault zones. The green oxide copper is in a block that has been faulted down into near contact with the protore. Protore means the same as hypogene (i.e. chalcopyrite and pyrite). In addition, the typical occurrence of the green copper oxides at Copper Mountain is on fractures and in veins that parallel the orientation of the faults.

Table 3
ACID BASE ACCOUNTING RESULTS

Mineral Type	Hole ID	Sample Interval	Acid Base Potential (ABP) EPA600	Acid Generating Potential (AGP) EPA600	Acid Neutralizing Potential (ANP) EPA600	Non Extractable Sulfur) S N-EX LECO	Pyritic Sulfur LECO	Sulfate Sulfur-SO ₄ LECO	Sulfur-TOTAL LECO
1	CG-02	6-16	5.4	0.9	6.3	<0.01	0.03	<0.01	0.03
1	CG-02	196-206	13	<0.3	13	<0.01	<0.01	<0.01	<0.01
1	CG-02	276-286	8.3	<0.3	8.3	<0.01	<0.01	0.01	0.01
1	CF+100-02+90	28-38	10.4	<0.3	10.4	<0.01	<0.01	<0.01	<0.01
1	CF+100-02+90	98-108	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01	<0.01
1	CF+100-02+90	168-178	6.5	<0.3	6.5	<0.01	<0.01	<0.01	<0.01
1	CF+100-02+90	278-288	7.8	<0.3	7.8	<0.01	<0.01	<0.01	<0.01
1	CE-4	133-143	46.7	<0.3	46.7	<0.01	<0.01	<0.01	<0.01
2	CG+75-2	0-6	4.2	<0.3	4.2	<0.01	<0.01	0.02	0.02
2	CG+75-2	36-46	7.3	<0.3	7.3	<0.01	<0.01	<0.01	<0.01
2	CG+75-2	76-86	39.9	<0.3	36.9	<0.01	<0.01	<0.01	<0.01
2	CE-4	23-33	9.3	<0.3	9.3	<0.01	<0.01	0.01	0.01
21	CG-02	46-56	4.9	<0.3	4.9	<0.01	<0.01	<0.01	<0.01
21	CE-4	83-93	4.2	<0.3	4.2	<0.01	<0.01	0.01	0.01
6	CF+100-02+90	358-368	16.1	5.6	21.8	0.01	0.18	0.01	0.2

Mineral Type	Mineralogy	Description
1	Leached capping	Iron oxides
2	Green copper oxides	Chrysocolla+/- malachite
21	Black copper oxides	Copper WAD, neotocite, tenorite, manganese oxides
6	Chalcopyrite-pyrite	Chalcopyrite and pyrite

2.5 QUALITY ASSURANCE PLANS

PDTI maintains a number of plans that contribute to the overall quality of the Tyrone Mine. These plans include:

Plan Type	Description
Group Safety Plans	Safety plans developed by each work group specific to their work

	environment.
Water Quality Monitoring Plans	Plans for monitoring the quality of groundwater related to each discharge plan.
Water Sample Collection QAP	Procedures for assuring the quality of water samples collected for monitoring the quality of groundwater.
Ore Control Sampling QAP	Procedures for assuring the quality of samples used to determine the content of copper at the working face.
Laboratory Analytical Protocols	Procedures used to determine the quality of data generated by analyzing rock samples for ore control.
Equipment Preventative Maintenance Schedule	Schedule for conducting regular servicing for each piece of equipment used at PDTI
SX/EW Cathode QAP	Procedures for assuring the quality of copper produced at the SX/EW.

2.6 SPILL CONTINGENCY PLANS

PDTI has an Emergency Response and Spill Contingency Plan for the PDTI SX/EW leaching operations. The plan addresses procedures necessary to respond to upset conditions within the SX/EW plant and associated facilities such as pipelines and raffinate storage tanks. The pit expansion area has no SX/EW facilities or other facilities which carry or store potential spill solutions.

PDTI operates under an approved Spill, Prevention, Control and Countermeasure Plan (SPCC), and all mining activities will conform with existing permits. No fuels, lubricants, chemicals, or hazardous materials will be stored in the Copper Mountain Pit Expansion area.

2.7 SCHEDULE OF OPERATIONS

Mining in the proposed Copper Mountain South Pit Expansion is scheduled to begin when all applicable permits are received. Mining will be conducted at an average rate of between 40,000 to 90,000 tons of material per day. The pit expansion will produce approximately 36 million tons of ore containing approximately 72 million pounds of recoverable copper. Table 4 summarizes the general activities at the mine and the approximate time frame in which these activities will occur. These mining related activities could take up to four years to complete, depending upon copper prices and mine economics.

Table 4
SCHEDULE OF MINING ACTIVITIES

Schedule	Activity	Tons of Ore Mined
Quarter 1	Drop cut to 6,350' and slot into existing pit area	2,860,000
	Mine 87% of 6,300' bench	4,330,000
Quarter 2	Finish 6,300' bench	650,000
Quarter 3	Mine all of 6,250' bench	5,600,000
	Mine 17% of 6,200' bench	940,000
Quarter 4	Finish 6,200' bench	4,530,000
	Mine 50% of 6,150' bench	2,660,000

Quarter 5	Finish 6150' bench	2,530,000
	Mine all of 6,100' bench	4,640,000
Quarter 6	Mine all of 6,050' bench	4,030,000
	Mine all of 6,000' bench	3,040,000

2.8 ACCESS ROADS AND UTILITIES

Access Roads

Access to the pit expansion will be through the existing Tyrone Mine and Copper Mountain Pit. A haul road will be constructed from the existing operations into the pit expansion area as shown on Map 1. The largest vehicle that will use the haul roads is the 250-ton haul truck. All haul roads are designed to safely accommodate the largest vehicle to use it; therefore the road will be built with a width of 120 feet, including appropriate safety berms. Road slope grades will be no greater than 10 percent. All other equipment included in the list of mine equipment may also use the roads. There will be no other access roads across federal lands to the pit.

Utilities

Electric power will be extended into the pit expansion area to operate the electric mining shovel. The utility line will be placed in previously disturbed areas along the proposed haul road into the pit.

Additional water will not be required for mining of the pit expansion. Changes to the current water supply distribution system or the existing water collection systems will not be required.

There will be no change to the existing sewage treatment system at PDTI, nor will there be an increase in sewage as a result of the development of the pit expansion. Solid wastes generated at PDTI will be managed by the existing PDTI facilities, following established procedures. Secure garbage containers will be placed near the site as necessary. Bulk refuse items will be sorted and disposed of in accordance with the current approved practice at PDTI. Non-mine waste disposal will not be allowed on the parcels and claims in this proposed POO. Solid refuse will be removed from the affected lands and disposed of in accordance with the current approved practice at PDTI. PDTI operates a Solid Waste Landfill for onsite waste and is permitted by the New Mexico Environmental Department.

3.0 RECLAMATION PLAN

As stated earlier, the primary purpose of this MPO/CCP is to satisfy BLM (43 CFR-3809) and NM Mining Act (Section 19.10.5.508) regulatory requirements. A critical component to both regulatory requirements is the development and submittal of a Reclamation Plan.

PDTI will coordinate with New Mexico State agencies (primarily MMD) and the BLM during the reclamation process to ensure that the reclamation meets state and federal requirements. The plan is intended to complement the Tyrone CCP submitted in March 2001. The plan provided herein is at a plan level of detail (sufficient for cost estimating), but flexible to allow for detailed adjustments in response to unforeseen contingencies. The reclamation plan may change in response to scientific advancements and operational considerations as appropriate in the future. The BLM and MMD will be notified of changes if they become necessary.

The objectives of reclamation are to minimize potential public safety hazards, provide for long-term stability of the site, protect the quality and integrity of groundwater and surface water, and produce a site capable of supporting the approved post-mining land use.

3.1 RECLAMATION AND REVEGETATION PRACTICES

The revegetation and reclamation practices applied to the Copper Mountain expansion area will be consistent with those approved for the Tyrone Mine as a whole. Consistent with the approved post-mining land use, areas proposed for revegetation will be seeded using the same seed mixture developed for the Tyrone Mine CCP (Table 5). Substitutions may be necessary due to seed availability and will be coordinated with the state and federal agencies.

Conventional drill-seeding methods used on medium textured soils with low rock fragment contents are probably not applicable to the Copper Mountain South Pit Expansion Project. Thus, alternative methods are proposed in consideration of the soil and topdressing conditions that exist at the site. The seedbed will be prepared by ripping the topdressing to a depth of 24 inches. The ripped furrows will be oriented across the slope and the surface will be left in a roughened condition to reduce overland flow and promote the infiltration of water. This soil surface configuration and the high rock fragment content of the topdressing preclude the use of a drill seeder. Therefore, the seed will be broadcast and covered using a chain or tire-drag. Straw or native grass mulch will be applied at a rate of at least two tons/acre and stabilized using a tackifier emulsion or by crimping. Long-stem mulch is preferred over shorter materials. The mulch should be weed free and contain a minimum of viable seeds associated with the mulch source (e.g., barley or wheat seeds).

3.2 RECLAMATION OF SITE ACCESS AND HAUL ROADS

Mine roads that are not needed for continued access (monitoring or access to other areas) will be reclaimed at the end of the project. The surface of these roads is anticipated to be constructed over/on non acid-generating material. In this case, reclamation of the haul road will involve ripping the haul road top surface to a depth of no less than two feet. The textural characteristics of the cover material will be supportive of a self-sustaining ecosystem. The ripped surface will be revegetated consistent with the currently approved Tyrone Mine CCP. While not anticipated, should acid-generating material be exposed in these areas during development, PDTI commits to covering the exposed acid-generating material with a minimum of 36 inches of topdressing followed by revegetation as specified in Appendix C of the Tyrone Mine Permit GR010RE Permit Revision 01-1.

Remaining site access roads will have drainage ditches and berms constructed to minimize storm water erosion of road surfaces. The revegetated areas within the pit expansion will total approximately 9 acres with 4.7 acres of bench/highwall remaining (Map 4).

Table 5
RECLAMATION SEED MIX AND RATES

Species^a	Life-Form	Duration^b	Seasonality	Rate^{a,c}
Primary				
Blue grama (<i>Bouteloua gracilis</i>)	Grass	Per	Warm	0.25
Side-oats grama (<i>Bouteloua curtipendula</i>)	Grass	Per	Warm	1.25
Black grama (<i>Bouteloua eriopoda</i>)	Grass	Per	Warm	0.10
Green sprangletop (<i>Leptochloa dubia</i>)	Grass	Per	Warm	0.15
Plains lovegrass (<i>Eragrostis intermedia</i>)	Grass	Per	Intermediate	0.05
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)	Grass	Per	Cool	1.25
New Mexico needlegrass (<i>Stipa neomexicana</i>)	Grass	Per	Cool	1.75
Streambank wheatgrass (<i>Agropyron dastachyum</i> v. <i>riparium</i>)	Grass	Per	Cool	1.50
Apache plume (<i>Fallugia pardoxa</i>)	Shrub	Per	NA	0.10
Mountain mahogany (<i>Cercocarpus montanus</i>)	Shrub	Per	NA	1.00
Winterfat (<i>Eurotia lanata</i>)	Shrub	Per	NA	0.60
Yellow sweet clover (<i>Melilotus officinalis</i>)	Forb	Ann	NA	0.15
Globe mallow (<i>Sphaeralcea</i> sp.)	Forb	Per	NA	0.10
Blue flax (<i>Linum lewisii</i>)	Forb	Per	NA	0.15
Total PLS (lb/ac)				8.40
Alternate				
Needle-and-thread (<i>Stipa comata</i>)	Grass	Per	Cool	ND
Thickspike wheatgrass (<i>Agropyron dastachyum</i>)	Grass	Per	Cool	ND
Smooth brome (<i>Bromus inermis</i>)	Grass	Per	Cool	ND
Sand dropseed (<i>Sporobolus cryptandrus</i>)	Grass	Per	Intermediate	ND
Tobosa (<i>Hilaria mutica</i>)	Grass	Per	Warm	ND
Bush muhly (<i>Muhlenbergia porteri</i>)	Grass	Per	Warm	ND
Squawberry (<i>Rhus trilobata</i>)	Shrub	Per	NA	ND
Rubber rabbitbush (<i>Chrysothamnus nauseosus</i>)	Shrub	Per	NA	ND
Prairie coneflower (<i>Ratibida columnaris</i>)	Forb	Per	NA	ND
White sweet clover (<i>Melilotus alba</i>)	Forb	Ann	NA	ND

^a Seed mix and rates are subject to change based on future investigations

^b Per = Perennial; Ann = Annual

^c Rate is in pounds of pure live seed (PLS) per acre (lb/ac); substitutions may change seeding rates

NA = Not applicable; ND = Not determined; PLS = Pure live seed

3.3 HISTORICAL OPENINGS AND EXPLORATION DRILLING SITES

Map 3 shows the location of four known underground openings with the proposed project area. This map also displays known information about the individual openings. Planned mining activities are not anticipated to intersect any of these openings or workings. In the unlikely event that unknown structures are encountered within the active mining area, MMD and BLM will be notified and where necessary, appropriate plans and mitigation will be presented to the agencies for review and approval.

Per requirement of Section 19.10.5.508.B.1.a of the New Mexico Mining Act, these openings will either be blasted shut and/or the openings filled/closed to preclude access and safeguard the openings from unauthorized entry.

Exploratory drill holes that will not be mined-out have been abandoned and reclaimed pursuant to requirements of applicable State and Federal regulations and exploration permits. The exploration drill holes have been plugged and abandoned by grouting (tremie pipe) or backfilling with a mixture of native materials and bentonite. Disturbed areas around the drill holes have been graded, roughened, and revegetated. One exploration hole was converted to a monitor well.

3.4 LEACH STOCKPILE AND WASTE ROCK RECLAMATION

Waste rock generated from the Copper Mountain South Pit Expansion will be placed in the San Salvador Pit area and ore will be placed on existing leach stockpiles within the PDTI permit boundary. Mining is expected to produce approximately 27 million tons of barren rock. Reclamation of the leach stockpiles and waste rock will be conducted in accordance with the approved Tyrone CCP.

In the unexpected event that significant quantities of sulfide or acid-generating materials are mined, this material will be hauled to the currently permitted No. 2 Leach Stockpile System.

3.5 HISTORIC LEACH PAD REMOVAL AND RECLAMATION

The historic leach stockpile (USNR Leach Stockpile), left by a previous operator, exists in the expansion area (Map 1). This leach pad will be removed as part of the proposed open pit mining and the material will be placed within the appropriate areas described above. Removal of this stockpile is considered to be an added benefit of this project to the overall reclamation of Deadman Canyon that PDTI has initiated with other projects in the area.

3.6 PREGNANT LEACH SOLUTION AND RAFFINATE PONDS

No pregnant leach solution or raffinate ponds will be constructed in association with the mining of the Copper Mountain South Pit. Reclamation management of existing facilities is described in the Tyrone CCP.

3.7 MINE AND PLANT FACILITIES

No new plant facilities will be constructed in association with the mining of the Copper Mountain South Pit. Reclamation of existing facilities is addressed in the Tyrone CCP.

3.8 OPEN PIT

Over time spalling of the benches and high-walls will create wedges of unconsolidated materials that will eventually support vegetation. Thus, the pit walls are predicted to ultimately reach a condition that mimics the pre-mining canyon walls. The slope gradients, soil thickness and vegetation cover are expected to reach a steady state condition that is controlled by the geology, climate, and aspect of the site. The existing canyon walls have gradients ranging from 45 to 65 percent and are sparsely vegetated with minor areas of rock outcrop and vertical cliffs. Most of the pit will not be visible except from the pit rim, adjacent ridges, and the air. The pit bottom of the expansion area will not be below the groundwater level and is not predicted to be covered by a pit lake. The flat areas will be ripped and/or covered to a depth of two feet and revegetated as described above.

Current sampling and understanding of the Copper Mountain South Pit Expansion area does not show that acid producing rock will remain or be exposed on the highwall(s) following mining. However, in the unexpected event that acid producing material is exposed within the pit expansion area, PDTI commits to

the following: If the material is located on flat surface (accessible pit bench or haul road) the area will be covered with a total of 36 inches of cover material and revegetated as specified in Appendix C of the Tyrone Mine Permit (GR010RE) Permit Revision 01-1. If the material is exposed in a pit wall, it will be left as is, as there will be no opportunity for water to pool over the area and/or remain long enough to provide an acid-generating impact on surrounding water quality.

3.9 POST MINING LAND USE

The principal land uses surrounding the Copper Mountain Pit include range, mining, and wildlife habitat. The New Mexico Mining Act (NMMA) requires that a post mining land use (PMLU) be selected for the permit area. The designated post mining land use for the Tyrone Mine permit area is wildlife habitat. The selection of the wildlife habitat PMLU for purposes of the NMMA does not preclude multiple beneficial uses (e.g., grazing, recreation, and watershed) in the post-closure period by the surface landowners (e.g., BLM). The reclamation of the disturbed areas will result in conditions that are consistent with a variety of land uses.

Successful implementation of the proposed reclamation plan will result in the development of an early-stage grass/shrub community within a larger plant community that is dominated by a mixed-evergreen woodland community. The areas of cliffs and talus associated with the pit walls will provide features that are consistent with the local topography in the canyons. Thus, the reclaimed area will provide a locally important increase in community level diversity that will benefit the broad range of wildlife adapted to the area.

The wildlife populations around the Copper Mountain Pit include big game species, small mammals, seasonal and residential birds, and reptiles and amphibians (BLM 1997). The proposed seed mix was designed primarily to provide erosion control and promote soil developmental processes, but also provides important features for wildlife. Table 6 lists some of the major functional attributes of the vegetation selected for use at Tyrone. Besides providing erosion control, the vegetation will provide forage, seeds, and cover for small mammals and birds. The reptiles, small mammals, and birds common to the mine area will benefit from the increased insect populations that are likely to accompany revegetation of the site. The shrubs, grasses, and forbs selected for use at Tyrone will provide nutritious forage and browse for large mammals (e.g., deer). In addition, the seed mix includes a number of valuable forage grasses that are absent or occur at a low frequency outside the permit area, thus, improving the range condition locally. Finally, the removal and/or containment of the leach stockpiles will improve the general quality of the watershed.

Table 6
ATTRIBUTES OF THE PRIMARY PLANT SPECIES PROPOSED FOR TYRONE MINE

Species	Character^a	Attributes and Function
Blue grama	NPWG	Sod and bunch grass; ground cover and forage
Side-oats grama	NPWG	Bunch grass; ground cover and forage
Black grama	NPWG	Bunch grass; ground cover and forage
Green sprangletop	NPWG	Erect bunchgrass; short-lived nurse plant with forage value
Plains lovegrass	NPIG	Bunch grass; ground cover and early spring forage
Bottlebrush squirreltail	NPCG	Persistent bunch grass; ground cover and forage
New Mexico needlegrass	NPCG	Persistent bunch grass; ground cover and forage
Streambank wheatgrass	NPCG	Sod-forming grass; ground cover and forage
Apache plume	NPS	Mid-height shrub; browse, cover, and erosion control
Rubber rabbitbush	NPS	Mid-height shrub; cover and erosion control
Four-wing saltbush	NPS	Mid-height shrub; cover, forage, and erosion control
Yellow sweet clover	IA/BF	Nitrogen-fixing forb; forage and ground cover
Globe mallow	NPF	Persistent mid-height forb providing browse
Bush penstemon	NPF	Persistent mid-height forb; cover and erosion control.

^a N = Native, I = introduced; P = perennial, A/B = annual or biannual; W = warm season, C = cool season; G = grass, S = shrub, F = forb.

3.10 RECLAMATION SCHEDULES AND RECLAMATION SUCCESS CRITERIA

The NMMA requires the development of a schedule indicating the anticipated initiation and duration of the reclamation activities. The schedules included below are based on the current mine operational plan, copper price and economics. The reclamation success criteria required by the MMD vary depending on the designated PMLU. The revegetation success criteria for the wildlife habitat PMLU are based on canopy cover, shrub density, and plant species diversity.

3.10.1 Reclamation Schedule

Reclamation activities at Tyrone are expected to occur episodically during mine operations, followed by final closure of the mine after metal extraction ceases. Reclamation activities will be conducted in association with periods of active mining when equipment is available for earth moving. Removal and reclamation of the historic leach pile will begin after the haul road is completed and in-pit mining is initiated. Waste rock from the pit areas will be hauled concurrently with mining to the San Salvador pit. The final reclamation of the backfill area, haul road and exploration sites would be conducted in association with closeout activities at the Tyrone Mine. The Copper Mountain South Pit Expansion haul road will remain for continued mining activities at Copper Mountain through the Tyrone Mine life. Following Cessation of Operations, reclamation of the haul road and exploration sites for the Copper Mountain South Pit expansion will be completed in association with closeout activities for the Tyrone Mine.

Assuming approval of the MPO/CCP in 2004, mobilization will commence shortly thereafter. Mining will continue for up to four years, depending upon economics. Following this, the mining fleet will demobilize and the reclamation described earlier in Section 3.0 will begin. Current plans call for reclamation to be initiated in 2008, with the majority of earthmoving activities (grading, ripping, and seeding) completed in 2009. Monitoring will occur until post mining land uses have been achieved and the agencies (BLM, MMD, and NMED) have signed-off on completed reclamation activities.

3.10.2 Revegetation Success Standards

Revegetation success will be evaluated relative to the Interim Technical Standards for Revegetation Success for the Tyrone and Little Rock mines (DBS&A 1999). These standards are based on the interpretation of site-specific data collected from reference areas and reclaimed lands. Environmental, topographic, jurisdictional, and economic constraints require that different levels of effort be applied to the disturbed areas. In particular, some of the pit walls cannot practicably be treated using standard reclamation techniques; thus, no revegetation success criteria are proposed for the pit walls. All other existing and future disturbance areas will be reclaimed and evaluated with respect to the reclamation success standards proposed for the Tyrone Mine. PDTI will meet the revegetation requirements of Section 19.10.5.508. NMAC and will use the same reference area as cited in the Tyrone Permit. This reference area is depicted on Map 6.

3.11 POST-CLOSURE MONITORING AND CONTINGENCY PLANS

The MMD guidance (1996) requires monitoring of revegetation during the bonding period to evaluate revegetation success, and NMWQCC Regulation 3107.A.11 requires the development of post-closure monitoring and contingency plans that are consistent with the terms and conditions of the applicable discharge plan. This section summarizes the general approach that will be used to meet these requirements.

3.11.1 Erosion and Drainage Control Structures

The reclaimed lands will be visually inspected for signs of excessive erosion (i.e., gullyng or extensive rilling), and significant erosion features will be mitigated to prevent future degradation of the site. Drainage channels, diversion structures, retention ponds, and auxiliary erosion control features will be inspected in accordance with professionally recognized standards (e.g., Natural Resources Conservation Service). Post-construction/reclamation inspection schedules will include provisions for periodic (annual or semiannual) and extreme event monitoring as appropriate for individual facilities.

PDTI will report evidence of excessive erosion and/or structural failures to the appropriate agencies in a timely manner. A written report detailing the nature and extent of the problem and a corrective action plan will be developed within 75 days after the problem is identified.

3.11.2 Revegetation Success Monitoring

The reclaimed areas will be monitored periodically after the final grading and the initial establishment of vegetation. Regular inspections will be made to determine the initial success of the seeding. Thereafter, vegetation monitoring will be conducted periodically starting three to four years after initial establishment of vegetation on the reclaimed lands. Vegetation will be monitored more frequently in the years prior to the bond release determination than in the mid-term period. The monitoring frequency may be determined by the relative success of the reclamation during the mid-term evaluation. At a minimum, the vegetation will be monitored for two consecutive years prior to bond release. Monitoring in the Copper Mountain area will be conducted as part of the regular Tyrone Mine monitoring plan.

3.11.3 Surface Water Quality

Post-closure surface water monitoring locations and schedules will be determined based on Tyrone's obligations under the Multi-Sector General Storm Water Permit administered by the USEPA as required under Discharge Plan 1341 (DP-1341) and the Tyrone Closure/Closeout Plan. Tyrone's Storm Water Pollution Prevention Plan will be modified to address sampling locations and frequencies for storm water runoff from the reclamation area as well as periodic inspections of the reclamation area. Map 3 shows the location of surface water monitoring sites in Deadman Canyon. Surface water monitoring for this site will be integrated into the requirements for the Tyrone Mine. The results of the surface water quality monitoring associated with DP-1341 will be reported to the NMED Surface Water Quality Bureau (SWQB). Should confirmed water quality exceedances or significant degradation of water quality occur, the SWPPP would direct an internal review of BMPs (e.g. cover, revegetation, etc.) and corrective actions taken as deemed necessary.

3.11.4 Groundwater Quality

Groundwater quality in the vicinity of the Copper Mountain pit will be monitored throughout the post-closure period as required under DP-166 and/or DP-1341 and the Tyrone Closure/Closeout Plan. Because this area is small relative to the existing operations at Tyrone, no additional monitoring wells are proposed in association with this project. The monitoring schedule, analytical requirements, location, and construction specifications for DP-166 monitor wells have been determined in consultation with the NMED. DP-166 for PDTI was initially approved on July 20, 1981, and subsequently renewed and modified on July 20, 1986, July 20, 1991 and December 16, 1997. DP-166 was amended on January 22, 1999 to include the North Racket sump as a PLS collection point. The latest DP-166 approval included 15 conditions and 13 specific requirements for operation, monitoring, contingencies, closure, and financial assurance for several facilities that have the potential to affect ground water quality including the Copper Mountain Pit. Map 4 illustrates the location of the existing groundwater and surface water monitor locations in the No. 2 leach stockpile area. Post-closure monitoring will be performed in accordance with the Tyrone Mine CCP and DP-1341.

Contingency plan(s) for post-closure water quality exceedances will be developed on a site-specific basis. In general, the contingency plans for groundwater will be consistent with the protocols established for NMWQCC Regulation 1203 (notification of discharge). Thus, PDTI will verify any potential exceedances and report them to NMED and prepare a corrective action plan for mitigation, and implement the mitigation measures pursuant to DP-1341. The corrective action plan will be developed and implemented in collaboration with the NMED.

Renewal and modification of DP-166 is pending NMED approval. As part of the DP-166 renewal application dated August 2002, PDTI requested that NMED modify DP-166 to incorporate portions of the Tyrone Mine not covered under a discharge plan. This request included incorporation of the Copper Mountain Mine project described in this plan.

4.0 MONITORING PLAN

Mining and monitoring of the expansion will be done in compliance with the permits listed in Table 7. With the exception of the MPO/CCP (this document), the other permits listed in Table 7 are in place.

Table 7
PHELPS DODGE TYRONE, INC.
REGULATORY FRAMEWORK

Permit Name	Regulatory Agency	Purpose of Permit	Status
Storm Water/NPDES	USEPA	Protection of Surface Water – Clean Water Act	Issued 2/28/01
Groundwater Discharge Plans DP-166 and DP 1341	NMED	Operational and Closure Discharge Plans for the Tyrone facilities required by NMWQCC regulations	DP-1341 Issued 4/8/03 DP-166 Issued 12/16/97
NM Mining Act Permit No. GR010RE	NMEMNRD, MMD	Compliance with NM Mining Act Regulations – Closeout Plan and Financial Assurance	Issued 4/12/04, Revision pending approval
Plan of Operations MPO/CCP	BLM	Operations on Land Administered by BLM (43 CFR 3809)	Pending
Title V Permit No. P147	NMED	Air Quality Operating Permit for Tyrone Mine	Current
MSHA ID # 29-00159	MSHA	Mine Safety & Training	N/A — Current

4.1 WATER QUALITY

PDTI operations at the Tyrone Mine include a water quality monitoring plan which is a requirement of the New Mexico Groundwater Discharge Permits, issued by the New Mexico Environment Department. A Discharge Plan (DP-166) for the Monitoring sites include groundwater wells and surface sample locations, which are shown on Map 3. The Discharge Plan requires quarterly monitoring of groundwater levels and groundwater quality to detect changes in groundwater that could occur from mining operations. The Discharge Plan also outlines sampling schedules, sampling protocols, and contingency requirements. A copy of the discharge plan, sampling sites and schedules, and sampling protocols are available from the NMED or from PDTI. PDTI currently operates under the terms of the existing (now expired) groundwater plan DP-166, and will operate under the terms of the new permit when approved by NMED.

4.2 AIR AND NOISE QUALITY

PDTI's mining operations are currently in compliance with Federal and State air quality regulations. The proposed action is covered under the current Title V permit No. P147 and will not require modifications to existing air permits or any additional air quality permits. The project area is an attainment area for air quality, and PDTI does not conduct regular ambient air monitoring at the mine. The EPA records moni-

toring data for the region near Tyrone, New Mexico. Monitoring data for the three closest stations is presented in Table 10, in Section 6.4.

4.3 REVEGETATION

PDTI will conduct vegetation monitoring of both volunteer revegetation and re-seeded areas during the third year after reclamation seeding in a manner similar to the agreement with the MMD for the Little Rock Mine (Permit Revision 97-1 to Permit No. GR007RE). Monitoring will continue at least every other year and for two consecutive years prior to bond release. Revegetation monitoring will include, at a minimum, canopy cover, plant diversity, and shrub density. The canopy cover survey and shrub density survey will be conducted using the survey techniques approved by the MMD. See Section 3.10.2 for Revegetation Success Standards.

4.4 STABILITY

PDTI has commissioned state of the art slope stability analyses for mining purposes which are used by mine planners to ensure efficient design and safety for mine workers (Call and Nicholas 1994). The slope stability studies performed for the Copper Mountain Pit indicate that the pit walls are stable from a large-scale failure perspective.

The study recommended a slope angle of 48 degrees in the area of the proposed pit expansion. The recommendation was based on results of bench-scale “Backbreak” stability analysis. For the area closest to Deadman Canyon, PDTI has designed a slope angle of 40 degrees. This coupled with the geology and bedding planes in this area will provide a stable slope. Steeper or shallower slopes may be warranted based upon site specific conditions encountered while mining. Regardless, these bedding planes and the in place geology act as aquitards against water flow and will mitigate against water migration from entering the Copper Mountain Pit via stormwater/surface water run-off from Deadman Canyon. The area between Deadman Canyon and the proposed pit wall is approximately 170 feet at its closest point. The structural database used in the analysis was derived from two oriented core holes and forty-two surface cells. The geomechanical database coupled with the estimated rock mass strength, which was derived from compressive strength and disc tension test results, suggests that zones of low rock mass strength should be small and should not contribute significantly to slope instability along final pit walls.

Spalling and minor cut-slope failures are expected to occur on the bench-highwalls, creating wedges of unconsolidated materials that will eventually support vegetation. Evidence of revegetation of the pit walls currently exists at Little Rock where trees and shrubs are colonizing the benches. Thus, the pit walls are predicted to ultimately reach a condition that mimics the pre-mining canyon walls. The slope gradients, solid thickness, and vegetation cover are expected to reach a steady state condition that is controlled by the geology, climate, and aspect of the site. The existing canyon walls have gradients ranging from 45 to 65 percent and are sparsely vegetated with minor areas of rock outcrop and vertical cliffs.

The top of the pit expansion will be approximately 48 feet vertically above the bottom of Deadman Canyon, and approximately 170 feet east of the canyon, at the closest point (see Maps 4 and 5). At this point, the top of the pit wall will be 30 feet across, and widening to 170 feet at the bottom of the drainage. The final pit floor will be about 120 feet below the bottom of Deadman Canyon.

4.5 WILDLIFE

PDTI will document wildlife use of reclaimed areas for a post-mining wildlife use in a manner similar to the agreement with the MMD for the Little Rock Mine (Permit Revision 97-1 to Permit No. GR007RE). Deer pellet group counts will be conducted quarterly (seasonally) beginning three years after reclamation has been completed. Bird diversity surveys will also be conducted quarterly (seasonally) beginning three years after reclamation has been completed. Results will be evaluated to determine wildlife use trends during re-establishment of a self-sustaining ecosystem.

PDTI will establish wildlife habitat features such as rock piles and or brush piles to promote floral and faunal diversity.

5.0 INTERIM MANAGEMENT PLAN

Mining is scheduled to begin when all applicable permits are received. The mine will normally work two shifts per day, 365 days per year. Current plans call for the Tyrone Mine to be operated continuously until all economic reserves are exhausted or economic conditions become limiting. Unforeseen circumstances, however, could require intermittent shutdowns or curtailments.

Because the Copper Mountain South Pit Expansion project is of relatively short duration for the mine, curtailments are less likely during this project. If a period of non-operation were to occur, PDTI will continue to comply with its Stormwater Pollution Prevention Plan and other environmental requirements. BMPs will be maintained to ensure compliance. Reclamation of the site would not commence until permanent closure of the site is eminent. Berms, signage, and any necessary public safety measures will also be installed.

During both short and long-term shutdowns, ground and surface water monitoring, as required by applicable permits will be performed.

6.0 OPERATIONAL AND BASELINE INFORMATION

Previous (Historical) Operations

The Copper Mountain area has been a historic source of copper for over 120 years. The first recorded mining activities date back to the early 1880's (Gillerman 1964). Evidence of prior mining activities exists throughout the vicinity as open pits, stopes, adits, stockpiles, and slag. The earliest activities in the area began on the Copper Mountain and Liberty Bell claims. The Southwest Copper Company is the first documented company to have developed the area for larger-scale mining. Copper ore was mined from large open cuts, stopes, and adits. Some copper was extracted from the ore by smelting as indicated by slag found in Deadman Canyon. Ore from the Liberty Bell claim was developed by relatively extensive underground mining methods. Later, R. P. Thompson and other lessees intermittently worked the area.

The properties remained idle after this earlier mining had ceased and little work was done until the 1970's, when United States Natural Resources, Inc. (USNR) acquired the property. The area was developed by open pit methods and the ore was placed on a leach stockpile to the north of the present day Copper Mountain Pit and on a leach stockpile to the south on the Gray Eagle Claim. A copper precipitation plant was built north of the area. As part of recent mining and reclamation efforts, PDTI removed the north stockpile from the drainage and demolished and covered the precipitation plant, but the south leach stockpile still remains.

In the 1970s, PDTI conducted large-scale, open pit mining activities in support of its mill, concentrator, and precipitation plants. In the 1980s PDTI built an SX/EW plant. Most of the open pit mining at the Tyrone Mine was conducted in pits (Main, Gettysburg, Savannah, etc.) near the Copper Mountain Pit. Several pit expansions have been completed within the Copper Mountain Pit. To date, 71 million tons of ore and 16 million tons of overburden have been mined by PDTI from Copper Mountain. This mining at the Copper Mountain Pit represents approximately 3 % of the total material mined at the Tyrone Mine complex since 1970.

Mining activities have occurred on the land contained within the proposed Copper Mountain South Pit Expansion prior to PDTI acquiring the mining claims. Activities including access road construction, exploration, underground mining, mine rock stockpiling, and leaching have impacted specific sites throughout the area. A discussion of the current condition of the project area follows:

Current Conditions

Since this project is included within the Little Rock EIS study area, many of the resources described in this section were mapped and described in detail in the Little Rock Final EIS and associated studies (BLM 1997). More information can be found in the Little Rock Final EIS (BLM 1997) and the Tyrone CCP.

Existing Copper Mountain Pit Mining Operations

PDTI began mining oxide ore from the Copper Mountain Pit in July 1990. Mining of the original Copper Mountain Pit was completed in February 1994. Total depth of the original Copper Mountain Pit was 400 feet at an elevation of 6000 feet amsl. A sump and dewatering system was installed in the bottom of the Copper Mountain pit, consisting of a barge-mounted pump and associated piping. The average annual pumping rate from the pit has ranged from 150 to 200 gallons per minute (gpm), however; the system is designed to pump 450 to 600 gpm. In April 2000, PDTI began mining a small extension on the south side

of the Copper Mountain Pit, which lasted until January 2002. A total of 71 million tons of ore and 16 million tons of waste rock were mined from the Copper Mountain Pit by PDTI.

6.1 BIOLOGICAL RESOURCES

Several biological surveys have been conducted at the Tyrone Mine. The most recent assessment occurred in September 2002 during a two-day site visit by a URS Corporation biologist. Other surveys include assessments during site visits by Dames & Moore environmental staff in 1994 and 1995, and threatened and endangered flora and wildlife surveys conducted by the Metric Corporation in 1993 and 1996. Biological data for the area has been also been collected by public agencies including U.S. Fish and Wildlife Service, U.S. Forest Service, New Mexico Department of Game and Fish, and the New Mexico Natural Heritage Program (BLM 1997).

Vegetation

The Copper Mountain Pit expansion area is primarily composed of three vegetation communities; disturbed/successional, mixed woodland, and disturbed/mixed-woodland mosaic. Table 8 displays the acres of the different vegetation types, by land ownership.

Table 8
VEGETATION COMMUNITY TYPES

Community Type	Acres			Percent of Total		
	BLM	PDTI	Total	BLM	PDTI	Total
Disturbed/Successional	0.7	3.5	4.2	2.3	11.2	13.5
Mixed Woodland	6.5	1.7	8.2	20.9	5.5	26.4
Mosaic	6.7	12.0	18.7	21.5	38.6	60.1
Total	13.9	17.2	31.1	44.7	55.3	100

The disturbed/successional community is characterized by large areas of exposed rock and human development caused by past mining activities including a leach pad and access roads. Much of the community is dominated by plumed brickellia (*Brickellia brachyphylla*), Rothrock's snakeroot (*Eupatorium rothrockii*), Wright's snakeroot (*Eupatorium wrightii*), Dakota mock vervain (*Glandularia bipinnatifida*), and silvery lupine (*Lupinus argenteus*).

The mixed woodland community dominates the southern portion of the proposed expansion area on a predominately north-facing slope. This community is dominated by woody species including point-leaf manzanita (*Arctostaphylos pungens*), Utah fenderella (*Fendlerella utahensis*), alligator juniper (*Juniperus deppeana*), beargrass (*Nolina microcarpa*), pinyon pine (*Pinus edulis*), ponderosa pine (*Pinus ponderosa*), Emery oak (*Quercus emoryi*), and gray oak (*Quercus grisea*).

The disturbed/mixed-woodland mosaic community is the largest community. Disturbed areas are primarily a result of previous mining and exploration activities characterized by roads cut through the woodland community. Dominant species are similar to those in the disturbed/successional and mixed woodland communities.

Wildlife

The Little Rock Mine Project Final EIS (BLM 1997) identified several wildlife species that are known or have the potential to occur in the vicinity of the Tyrone Mine. The proposed Copper Mountain South Pit expansion area is within the study area boundary of the Little Rock Mine EIS, and wildlife species occurring in the expansion site are expected to be similar to those that occur in the surrounding area.

Fifty-one species of mammals, over 100 species of birds and 36 species of reptiles may potentially occur on or near the area surrounding the pit expansion. Species that were commonly observed during surveys include desert cottontail (*Sylvilagus audubonii*), rock squirrel (*Spermophilus variegatus*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), Gambel's quail (*Callipepla gambelii*), bridled titmouse (*Parus wollweberi*), rufous-sided towhee (*Pipilo erythrophthalmus*), and the acorn woodpecker (*Melanerpes formicivorus*).

6.2 WATER RESOURCES

Surface Water

The proposed pit expansion would occur within the Deadman Canyon watershed. This watershed has a total basin area of approximately 6.2 square miles, an average channel slope of approximately 7 percent, and has no perennial surface stream water. The maximum elevation of the drainage is approximately 8,020 feet and the outlet elevation is about 5,620 feet. There are approximately three square miles of the Deadman Canyon basin above the proposed Copper Mountain South Pit Expansion.

PDTI has incorporated into the project design measures to mitigate erosion and potential flood effects by designing a buffer between the pit and Deadman Canyon, to prevent the potential for flood water to overflow into the pit. Specifically, as vegetation is cleared, a berm will be constructed to prevent run-off towards Deadman Canyon. From here, activities (grading and blasting) will be sloped towards the pit (to the east/southeast). Since mine development will occur away from Deadman Canyon and there are no up gradient lands or slopes from the disturbed area, no run-off controls, are deemed necessary. If berm construction for safety purposes results in measurable sedimentation and/or erosion, silt fences will be constructed on the down gradient slope of the berm(s). Natural vegetation between the berm(s) and Deadman Canyon should provide an adequate filtering mechanism to mitigate any impact from this activity. BMPs outlined in the mine's Stormwater Pollution Prevention Plan will be employed to minimize erosion and discharge of suspended solids to Deadman Canyon. Map 5 shows a cross section through the Deadman Canyon/Pit Expansion area. Since the final elevation of the pit will be substantially below the flow line of Deadman Canyon, any water collecting in the pit will not flow into the Canyon.

Data collection for the Little Rock Mine Final EIS (BLM 1997) included surface water samples from drainages and seeps within the Deadman Canyon drainage. The four closest collection locations to the pit expansion, Seep 2, Upper and Lower, and Seeps 3 and 4 are located downstream of the north boundary of the pit expansion area. Total dissolved solids (TDS) and pH of water collected at the seeps ranged from 2,700 to 4,500 ppm and 3.64 to 3.97, respectively. Water chemistry of these seeps may be influenced by past mine workings located on an adjacent hillside and by naturally occurring mineralization. Water type is generally characterized as calcium-sulfate. Another sample location, DC-1, is located about one mile upstream of the Copper Mountain site and had TDS (ppm) and pH values that ranged from 168 to 206 ppm and 6.31 - 7.56, respectively.

No discharge of any process wastewater to any surface water course is planned for mining operations. Should mine dewatering water need to be discharged to a surface water course, a NPDES permit will be required.

Groundwater

Regional groundwater in the project area occurs primarily within the Tertiary igneous rocks and flows generally to the northeast, toward the Main Pit. The background regional water quality in the project area ranges from sodium-calcium-bicarbonate type to calcium-sulfate type water.

Depth to groundwater in the Deadman Canyon drainage is typically about 50 to 100 feet below ground surface. On the ridges and hills around the Deadman Canyon, the depth to groundwater can be several hundred feet. The groundwater level in the Copper Mountain Pit is at approximately the existing pit bottom.

Analytical results from regional aquifer monitoring wells TWS-8, 9, 41, and 42 installed in Deadman Canyon (Map 3) indicate that the groundwater meets NMWQCC standards. In addition, historic analytical data from regional aquifer monitoring wells SXMW01, SXMW02, and SXMW03 in the vicinity of the SX/EW plant indicate that the water quality in that area has not been impacted by mine operations. These monitor wells were dry during the most recent monitoring period and historical data indicate that they went dry due to the fact that they are within the hydraulic capture zone of the Tyrone Main Pit. Closer to the Tyrone Main Pit, regional groundwater quality indicates impacts from the mine operations. The Main Pit hydraulic capture zone controls these impacts. Regional groundwater in the vicinity of the Copper Mountain Pit also ultimately reports to the Tyrone Main Pit.

A relatively thin, shallow groundwater system is present in the alluvial sediment of Deadman Canyon. This shallow system is “perched” on top of the more competent bedrock. The depth to groundwater in this perched alluvial system ranges from a few feet to about 20 feet. Flow in the alluvium is to the north, along the trend of the Deadman Canyon drainage. Water quality trends from a calcium-bicarbonate-sulfate type in the south to a calcium-sulfate type in the north. The alluvial groundwater system was impacted historically by seepage from the Copper Mountain leach operation (operated by a company other than Phelps Dodge) as well as seepage from the Nos. 2 and 2A Stockpiles.

Phelps Dodge installed numerous seepage capture systems to address these issues and also reclaimed the historic leach operation operated by others. The water quality in the shallow alluvial system has dramatically improved over time since these corrective actions were taken. Many of the shallow wells now meet standards for total dissolved solids and several other constituents under normal conditions. PDTI expects that these systems will continue to improve over time in response to the control systems. Expanding the Copper Mountain Pit and mining of the remaining historic leach stockpile are also expected to improve shallow water quality in the area, as this will remove a source of material that could adversely impact water quality. Drainage from Seep 8, located within the expansion area, will no longer drain into Deadman Canyon, but will drain into the Copper Mountain Pit. PDTI has included the Copper Mountain South Pit Expansion in its groundwater renewal application for Discharge Permit 166 permit issued by the NMED.

6.3 REGIONAL GEOLOGY

The Silver City region lies within a broad transitional zone between the Colorado Plateau and Basin and Range provinces. To the south and southwest, Paleozoic to Mesozoic sedimentary rocks and younger

volcanic rocks are exposed in north to northwest-trending ranges separated by broad alluvial valleys. Northward, sedimentary formations thicken and form the broad highland plateau of the Colorado Plateau.

The Tyrone district is located on the eastern flank of the Big Burro Mountains, and just south of the Little Burro Mountains. The Big Burro Mountains are dominantly comprised of Precambrian rocks that have been intruded by numerous Laramide to mid-Tertiary stocks, plugs, sills, and dikes. The Tyrone mine is situated along the northeast edge of one of the larger Laramide intrusions known as the Tyrone stock. The stock is dominantly composed of quartz monzonite to granodiorite, but grades into more porphyritic phases at the mine. Late Cretaceous sedimentary strata, and early Tertiary volcanic rocks, have mostly been eroded from the district but are locally preserved in the Little Burro Mountains. Additional details on the local geology can be found in DuHamel, et al. (1995).

6.3.1 Geochemistry

The reserves in the Copper Mountain South Pit occur primarily as copper oxides. The ore and waste material that will be mined from the Copper Mountain South Pit are net-acid-neutralizing copper oxides yielding environmentally favorable conditions during operating and closure periods. The ore and waste material that is mined will be placed on existing permitted stockpiles. See Section 2.4 for additional rock characterization.

6.4 AIR AND NOISE

Air

Meteorological data is collected at the Fort Bayard, New Mexico, National Weather Service Station. This station is located approximately 20 miles northeast of the Tyrone Mine and is considered to be representative of the site area. Southwestern New Mexico has a dry desert climate. Average annual rainfall is 15.7 inches (1897-1993) with July and August being the wettest months having average rainfalls between 3.2 and 3.4 inches. Annual snowfall is 10.4 inches falling mostly between December through March. Average maximum temperature varies from 52 degrees Fahrenheit in December and January to 87 degrees Fahrenheit in June and July. Average minimum temperatures vary between 25 degrees Fahrenheit in January and 58 degrees Fahrenheit in July. Winds tend to be moderate in this region with higher speed winds occurring during the springtime (BLM 1997).

Attainment status for pollutants within the project area is determined by monitoring levels of criteria pollutants for which National Ambient Air Quality Standards (NAAQS) and New Mexico Ambient Air Quality Standards (NMAAQS) exist. The applicable standards are presented in Table 9.

Table 9
AIR QUALITY STANDARDS

Pollutant	Averaging Period	New Mexico Standards	National Standards	
			Primary	Secondary
Carbon monoxide	1-hour	13.1	40,000 ug/m ³ (35 ppm)	---
	8-hour	8.7	10,000 ug/m ³ (9 ppm)	---
Lead	Calendar quarter	---	1.5 ug/m ³	1.5 ug/m ³
Sulfur dioxide	3-hour	---	---	1,300 ug/m ³ (0.5 ppm)
	24-hour	0.1	365 ug/m ³ (0.14 ppm)	---
	Annual	0.02	80 ug/m ³ (0.03 ppm)	---
PM ₁₀	24-hour	---	150 ug/m ³	150 ug/m ³
	Annual	---	50 ug/m ³	50 ug/m ³
PM _{2.5}	24-hour	---	65 ug/m ³	65 ug/m ³
	Annual	---	15 ug/m ³	15 ug/m ³
TSP	24-hour	150 ug/m ³	---	---
	7-day	110 ug/m ³	---	---
	30-day	90 ug/m ³	---	---
	Annual	60 ug/m ³	---	---
Ozone	1-hour	---	235 ug/m ³ (0.12 ppm)	235 ug/m ³ (0.12 ppm)
Nitrogen dioxide	24-hour	0.10 ppm	---	---
	Annual	0.05 ppm	100 ug/m ³ (0.05 ppm)	100 ug/m ³ (0.05 ppm)
Hydrogen sulfide	1-hour	0.01 ppm	---	---
Total reduced sulfur	½-hour	0.003 ppm	---	---

Source: EPA website: www.epa.gov/airs/criteria.html, New Mexico ambient air quality standards (NMAC Title 20, Chapter 2, Part 3) downloaded from New Mexico website: www.nmenv.state.nm.us/Common/regs_idx.html

New Mexico has attainment/non-attainment designation with regard to five pollutants: total suspended particulate matter (TSP), sulfur dioxide, carbon monoxide, nitrogen dioxide, and ozone. The area around the pit expansion is designated as unclassified, with one exception. The existing Hurley Smelter, located approximately 15 miles east of the project area, is classified as non-attainment for sulfur dioxide in a 3.5 mile radius around the facility. The State of New Mexico has requested that this area be redesignated as attainment.

Inhalable particulate, or PM₁₀, is the criteria pollutant of greatest concern for the proposed pit expansion. The EPA has recorded monitoring data for the region near Tyrone, New Mexico. Monitoring data for PM₁₀ for the last three years with complete records is provided in Table 10.

Table 10
MONITORED PM₁₀ DATA (ug/m³)

Station	Year	Number of Samples	1 st Maximum 24-hour	2 nd Maximum 24-hour	Annual Mean
Cobre (Monitor ID 350170001811022)	1998	62	35	33	18.4
	1999	60	48	43	21.5
	2000	58	44	34	19
Hurley (Monitor ID 350170009811021)	1998	58	35	29	16.5
	1999	58	51	48	19.5
	2000	57	38	33	16.4
Silver City (Monitor ID 350170002811021)	1998	56	34	33	17.8
	1999	59	52	48	20.7
	2000	58	48	43	19.2

EPA AIRData Website: www.epa.gov/aqspubl1/air_quality_tables.html

Noise

Noise in the surrounding area has not been surveyed, however, ambient noise levels typical of remote mining areas is around 30 L₉₀ dBA (BLM 1997). At the Copper Mountain Pit Expansion, the closest residence is located in T19S, R15W, Section 29, over 7,900 feet away. The second closest receptor is a ranch residence located in T19S, R15W, Section 8, over 2 miles distant from the pit expansion. The closest community is Tyrone, located approximately 6 miles to the northeast.

Noise level criteria used for impact analysis are typically based on recommendations from the EPA (1974) and on standard engineering practices. The EPA has determined that equivalent noise levels (L_{eq}) greater than 70 A-weighted decibels (dBA) to be a risk to public health and welfare, and day-night noise levels (L_{dn}) greater than 55 dBA to be an annoyance to humans. These values are typically used to assess the noise impact from earth-moving equipment. The U.S. Bureau of Mines (1980) developed annoyance and damage criteria for noise levels produced from blasting. The Bureau of Mines has determined that peak linear decibel levels (dBL) should not exceed 129 to minimize annoyance, and should not exceed 134 dBL to minimize the possibility of structural damage.

The noise impact assessment for the Little Rock Mine EIS included a study area that encompassed the Copper Mountain South Pit Expansion area. The results of the assessment would be considered to be generally applicable to the proposed Copper Mountain South Pit Expansion due to the proximity of the Little Rock Mine to the Copper Mountain Pit, and the similar nature of noise generating activities at both locations. Receptors at the Little Rock Mine were considerably closer (3,000 feet to closest residence) than the closest receptor at the Copper Mountain South Pit Expansion (7,900 feet). All noise levels for earth-moving and blasting activities were below the EPA and Bureau of Mines respective criteria in the Little Rock Mine analysis, and it would be expected that noise levels at Copper Mountain would be lower than for Little Rock Mine.

Over large distances, such as those between the receptors and the pit, air blast propagation is strongly dependent on wind, temperature, and terrain conditions. Under ideal propagating conditions (i.e., a receptor located downwind from the blast during a temperature inversion), air blasts could be audible at any of the identified residences. Measures to reduce potential effects include scheduling blasting during daytime operations.

6.5 LAND USE

Map 2 shows land jurisdiction (property ownership) in the proposed pit expansion area. Total area associated with the MPO/CCP is approximately 31 acres, of which about 13.9 acres are BLM and 17.2 acres are private land. The Gila National Forest is located about 0.75 miles west of the site.

The project area is located in Grant County. The project does not conflict with local land use plans or regulations. BLM land is managed according to guidelines and policies outlined in the Mimbres Resource Management Plan (BLM 1993). Mining is an allowed land use in the Mimbres Resource Area, in accordance with the multiple-use policies directives outlined in the Federal Land Policy And Management Act of 1976.

Existing land use in the vicinity of the pit expansion is influenced by past and ongoing mining operations, including the Tyrone and the Little Rock Mines. The area of the pit expansion has experienced some past mining activity, but is generally vacant land that can be used by wildlife. The two closest residences are isolated ranch buildings, one located approximately 2.2 miles to the northwest in T19S, R15W, Section 8, and the other located approximately 1.5 miles to the southwest in T19S, R15W, Section 29.

6.6 CULTURAL RESOURCES

The project area was subjected to an intensive pedestrian survey for cultural resources by Human Systems Research, Inc. in March 2002. One historic site was located on private land, and three isolated occurrences, including a horseshoe and prospect pits, were recorded. The site (LA 135,556) is associated with earlier mining activities; probably leach processing, and is less than 50 years old. The prospect pits are on BLM lands, but outside the area that will be impacted by mining or reclamation operations. None of the resources were recommended as eligible for the National Register of Historic Places.

6.7 OTHER INFORMATION

6.7.1 Mitigation

Wildlife

Effects to wildlife will be minimal. The Little Rock Mine EIS survey for threatened, endangered and sensitive species included the area of the Copper Mountain South Pit Expansion. The Biological Assessment for the EIS resulted in a determination of no-effect to for all federally listed species potentially occurring in the project area. A biological survey for sensitive species was also conducted in September of 2002 for the pit expansion area and no special status species were identified. Additional surveys or mitigation for special status species is not warranted or planned for the pit expansion.

Vegetation

As noted above under wildlife, previous surveys have not discovered any special status species in the project area, including plant species. The green-flowered pincushion, a BLM sensitive species, is known to occur in the Tyrone Mine, although suitable habitat is not present in the pit expansion area. However, should a population be discovered during mine development, they will be transplanted or otherwise salvaged.

Section 3.1 of the reclamation plan specifies the requirements for revegetation. During subsequent monitoring of the revegetation success, adjustments will be made to the reclamation plan as needed.

Water Quality

PDTI will continue the water quality sampling plan and maintain water quality improvement actions such as the systems that capture seepage from historic mining operations as well as seepage from the Nos. 2 and 2A stockpiles. As part of the Copper Mountain South Pit Expansion project, PDTI plans on mining the remaining historic leach stockpile that is expected to improve the shallow groundwater in the area.

The Copper Mountain Pit Expansion will operate under plans and permits that address the prevention of surface and groundwater pollution such as the Ground Water Discharge Permit issued by the New Mexico Environment Department, Ground Water Quality Bureau, the PDTI Emergency Response and Spill Contingency Plan, and the PDTI Storm Water Pollution Prevention Plan.

Air and Noise

The haul road will be watered during haul operations to reduce dust emissions. Sufficient watering will be applied to control particulate emissions outside of the permit area. The reclamation plan addresses issues of revegetation and monitoring of the success of reclamation. This will mitigate dust and particulate emissions from mined areas. Blasting will occur during daylight hours to avoid nighttime noise effects from blasting to receptors.

Cultural Resources

If previously unknown and unrecorded cultural resources are located during the mining process, activities around the resources will stop and the BLM and State Historic Preservation Officer will be notified.

Other Mitigation

PDTI will implement the reclamation plan to be approved by the MMD and BLM. The plan will comply with environmental protection measures specified by the BLM (43 CFR-3809) and the MMD/NM Mining Act (Section 19.10.5.508).

During ground disturbing activities, PDTI will, to the extent possible, protect survey monuments, reference monuments, bearing trees and other survey reference points. Should it be necessary to remove a survey point during operations, the appropriate BLM officer will be notified.

7.0 RECLAMATION COST ESTIMATE

The costs associated with the proposed reclamation plan will be estimated in accordance with the protocols established for the Tyrone Mine. The closure costs will be detailed in a separate submittal following a determination by the BLM and MMD that the MPO/CCP is approvable. The cost estimate will include third-party calculated numbers that include contingencies per 43-CFR 3809 and the NMMA. No surface disturbing activities associated with this request will be initiated until adequate financial assurance is accepted by the agencies.

8.0 PREVENTION OF UNNECESSARY AND UNDUE DEGRADATION

PDTI will prevent unnecessary or undue degradation on public lands by complying with the performance standards found in 43 CFR 3809.420. Section 9.0 of this Plan provides a table indicating where the general and specific performance standards are addressed.

PDTI will prevent unnecessary or undue degradation on public lands by assuring that all operations are designed to be reasonably incident to the mining operations that will be carried out on BLM lands. As defined in 43 CFR 3715.0-5, a person of ordinary prudence would determine that all PDTI activities, methods, and equipment are reasonably incident to prospecting and mining the valuable mineral deposit (copper) on public lands. Essentially, this means that there will be no activities, expenditure of labor or resources, or construction of structures that are not for the express purpose of defining, developing, mining, and processing the copper deposit on public lands. In accordance with 43 CFR 3715.2 (POO Sections 8.2.1 – 8.2.5), 3715.2-1 (POO Section 8.2.6), and 3715.3-2 (POO Sections 8.2.7 – 8.2.12), the following information is provided to the BLM. The activities that PDTI will be engaged in on public lands are further described in Section 2.0 of this Plan.

PDTI will be engaged in certain activities on public lands described in Section 2.0 of this Plan. As described, all aspects of the proposed mining operation and occupancy of public lands will involve the mining and processing of the locatable copper ore. The amount of materials other than copper ore that will be removed from public lands, i.e., vegetation and waste rock, will only be that which is required to mine the ore; and therefore would be considered reasonably incident.

The activities and occupancy of public lands will constitute substantial regular work. Upon approval of this Plan, PDTI will begin the operations as described in Section 2.0. According to the schedule of operations (Section 2.7), the work will be continuous (assuming economic conditions warrant). Activities will include drilling, blasting, loading, and hauling of ore and waste rock, as described in Section 2.2. Post-mining activities on public lands will include reclamation, as described in the state-approved reclamation plan (Closure/Closeout Plan).

PDTI has determined, through exploration activities, that the mineral resources located on public lands are economically recoverable. PDTI has determined that there are approximately 72 million pounds of recoverable copper that will be mined. As this proposed operation is an extension of an existing pit, there is a reasonable expectation that it will result in the extraction and beneficiation of copper ore. Recovery of these minerals in accordance with this Plan constitutes a major investment in equipment and resources and would not be undertaken without this expectation.

In accordance with 43 CFR 3715.7, upon Plan approval, BLM field staff will be able to physically verify the activities described in this Plan. BLM will be allowed access to the site for a review of all activities on public lands.

PDTI utilizes operable equipment at the Tyrone Mine that is appropriate, both in terms of physical requirements and cost effectiveness for the job that is undertaken. All equipment is routinely maintained according to manufacturer's suggestions and industry standards at existing facilities at the Tyrone Mine. The appropriate equipment is presently operable and located at the mine site adjacent to the public lands proposed for mining in this Plan. A list of this equipment that will be used in the execution of this plan is provided in Section 2.0 of this Plan.

In addition to the activities described above (3715.2-1), PDTI's occupancy of public lands will also protect valuable minerals from theft; protect the equipment from theft or loss; protect the public from this equipment; and protect the public from hazardous situations on public land. The current mine and equipment is protected by restricted public access to the mine site, facilities, and equipment. There are fences and locked gates and signs posting the property that do not allow public access. This is for both the protection of the public and of the PDTI assets. This protection will be extended to the public lands upon approval of this Plan. Mine employees and guests and visitors to the mine are required to comply with a mine safety plan and are equipped with appropriate and required safety equipment. Visitors to the site are required to check in prior to entrance through the main gate, which includes a manned checkpoint. A safety briefing is provided to visitors prior to entrance into the mine site. As this Plan is an extension of an existing mine operation, all safety and protection procedures currently in place will be extended to operations on public lands.

The proposed occupancy will also be temporary in nature. Mining of public lands is scheduled to take up to four years to complete (see Section 2.7). Reclamation of the lands is described in Section 3.0 of this MPO/CCP. In addition to the mining activities, PDTI will install fences, signs, water lines, an electric supply line, and a water fill-up station. The fence will be installed around the proposed pit limit or pit expansion boundary... The temporary water line and electric supply line will be installed along the haul road. A description of the haul road is included in Section 2.2 of this Plan. The temporary water fill-up station will be somewhat portable, as it will move according to areas being mined. The electric supply line is to supply power to the electric shovel. The water is to fill the water trucks that are used in dust suppression for the mine and haul road. The fences, power line, and water supply line are extensions of existing facilities currently in use at the Tyrone Mine. The water and electric supply lines and water fill-up station will be placed on previously disturbed land within the Copper Mountain Pit and pit expansion.

The proposed occupancy meets the conditions specified in 43 CFR 3715.2 and 3715.2-1, as PDTI has completed substantial regular work that will lead to the extraction and beneficiation of minerals (copper). It will involve observable on-the-ground activity (mining) that BLM may verify, and PDTI will use appropriate equipment, listed in Section 2.2 of this Plan, for this mining and beneficiation. All security operations in place will be maintained to protect minerals and equipment from theft or loss. The PDTI property is fenced and gated. Security fencing will be extended onto BLM lands as part of the development of the pit expansion. The public is protected from surface uses, existing and proposed, by security measures including fencing, gates, security stations, and patrols. Additionally, mining activities are planned for two shifts per day, 365 days per year.

No new permanent structures are planned for the Copper Mountain South Pit Expansion. Temporary structures will include an electric service line extension, the temporary extension of the water line, a water fill-up station, fences, and signs. The haul road into the Copper Mountain Pit will be extended onto public lands. The fence will be constructed along the proposed pit design limit or along the proposed mine permit boundary. The electric and water lines will be constructed across previously disturbed land along the edge of the haul road. The water fill-up station will be portable. All structures/facilities, except the fence, will be removed upon cessation of mining. The haul road will be ripped and reclaimed in accordance with stipulations in the state-approved reclamation plan.

Property fences will be extended onto public land as required to keep the public from accessing the mining areas. Signs will be posted declaring the property to be off limits to the general public. Excluding the public from access to these lands is required to protect both the PDTI investments and resources and the public from safety hazards. Access to the public land will be by means of the existing mine access and the haul road shown in Map 1.

No public lands, not being mined or under the control of PDTI, will be excluded from public access. Access to these lands, surrounded by private land, will remain open to the public to the extent that it is currently accessible.

9.0 APPLICABLE PERFORMANCE STANDARDS

Table 11
PERFORMANCE STANDARDS

General Performance Standards	Location in Plan	Comment
Technology and Practices	Section 2.2	
Sequence of Practices	Section 2.7	
Land-Use Plans	Section 6.5	
Mitigation	Section 6.7.1	
Concurrent Reclamation	Section 3.0	Where activities are completed and no further access or activity is proposed, Final (concurrent) Reclamation will be initiated.
Compliance with Other Laws	Section 1.0; 4.0	
Specific Standards		
Access Roads	Section 2.8	
Mining Wastes	Section 2.2.4	
Reclamation	Section 3.0; 7.0	Reclamation Plan to be approved by the MMD and BLM
Air Quality	Section 4.2	
Water Quality	Section 4.1	
Solid Wastes	Section 2.8	
Fisheries, Wildlife and Plant Habitat	Section 4.3;4.5	
Cultural and Paleontological Resources	Section 6.6	
Protection of Survey Monuments	Section 6.6	
Fire	Section 2.5	Mine safety plans
Acid-Forming, Toxic or Other Deleterious Materials	Section 2.4	
Leaching Operations and Impoundment	Section 2.2.3	
Maintenance and Public Safety	Section 2.5	Mine maintenance and mine safety plans

10.0 ACKNOWLEDGEMENT

It is understood that should the nature of the operation change or be modified, a plan of operations and reclamation plan may be required.

A bond, equivalent to the actual cost of performing the agreed upon reclamation measures will be required before this plan can be approved. Bonding and any bond reduction amount will be set on a site specific basis by the lead agency in coordination with the cooperating agency.

It is understood that any information provided with this notice that is marked confidential will be treated by the agency in accordance with that agency's laws, regulations, or rules.

Date

Rick N. Mohr
General Manager Phelps Dodge Tyrone, Inc.

cc: Attention: Karen Garcia
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11.0 REFERENCES

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- BLM. 1993. Mimbres Resource Area, Resource Management Plan.
- Call & Nicholas, Inc. 1994. Copper Leach Pit/Bao Pit/San Salvador Hill Pit – Slope Design Study. Report prepared for Phelps Dodge Corporation. March 1994.
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